

CLAIMS

1. A micropump utilizing gas generation comprising:
a silicon substrate having a reservoir for H_2O_2
5 solution formed therein;
a $\text{SiO}_2/\text{Si}_3\text{N}_4$ film formed on the silicon substrate; and
a PDMS combined on the $\text{SiO}_2/\text{Si}_3\text{N}_4$ film,
wherein the PDMS includes a reservoir for MnO_2
confronting the reservoir for H_2O_2 solution on the other
10 side of the $\text{SiO}_2/\text{Si}_3\text{N}_4$ film, a sample reservoir connected to
the reservoir for MnO_2 through a conduit, a sample injection
opening connected to an end of the sample reservoir, and a
minute channel leading to an exterior of the micropump from
another end of the sample reservoir.
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2. A production method of a micropump utilizing gas
generation, comprising the steps of:
forming a reservoir for MnO_2 , a sample reservoir
connected to the reservoir for MnO_2 through a conduit, a
20 sample injection opening connected to an end of the sample
reservoir, and a minute channel leading to an exterior of
the micropump from another end of the sample reservoir by
forming a negative photoresist SU-8 layer and patterning on
a silicon substrate;
25 forming a PDMS on the SU-8 layer;
forming a SiO_2 film and a Si_3N_4 film sequentially on
another silicon substrate;
forming a reservoir for H_2O_2 solution by etching the
bottom surface of the silicon substrate having the SiO_2 film
30 and the Si_3N_4 film formed thereon;
securing a bottom plate to the bottom of the reservoir
for H_2O_2 solution; and
combining the PDMS on the silicon substrate having the
reservoir for H_2O_2 solution formed therein after removing
35 the PDMS from the silicon substrate and SU-8 pattern.

3. A micropump utilizing gas generation comprising:
a bottom plate constituting a bottom surface;
a hot-wire formed inside a reservoir on the bottom
5 plate; and
a PDMS combined on the bottom plate,
wherein the PDMS includes the reservoir, a sample
reservoir connected to the reservoir through a conduit, a
sample injection opening connected to an end of the sample
10 reservoir, and a minute channel leading to an exterior of
the micropump from another end of the sample reservoir.
4. The micropump utilizing gas generation of claim 3,
further comprising a paraffin layer mixed with MnO_2 powder
15 formed on the hot-wire,
wherein the reservoir reserves H_2O_2 solution.
5. The micropump utilizing gas generation of claim 3,
wherein the reservoir reserves NaHCO_3 solution.
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6. The micropump utilizing gas generation of claim 3,
further comprising a water droplet enveloped in a Parafilm
arranged on the hot-wire,
wherein the reservoir reserves a mixture of NaHCO_3 and
25 $\text{HOC}(\text{COOH})(\text{CH}_2\text{COOH})_2$.
7. A production method of a micropump utilizing gas
generation, comprising the steps of:
forming a hot-wire inside a reservoir on a bottom
30 plate;
combining a PDMS having the reservoir formed therein
on the bottom plate; and
combining another PDMS including a sample reservoir
connected to the reservoir through a conduit, injection
35 openings respectively connected to each ends of the

reservoir and the sample reservoir, and a minute channel leading to an exterior of the micropump from another end of the sample reservoir on the PDMS having the reservoir formed therein.

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8. A cell culture unit utilizing gas generation comprising:

a bottom plate constituting a bottom surface;

10 a hot-wire formed inside a reservoir for holding NaHCO_3 on the bottom plate;

a PDMS including the reservoir formed by combining the PDMS on the bottom surface and an air supply line connected to the reservoir through a conduit;

a thin permeable PDMS film arranged on the PDMS; and

15 a PDMS cover being combined on the PDMS film and having an engraved media-line confronting the air supply line on the other side of the PDMS film.